

REMARKS

This Amendment accompanies a Request for Continued Examination (RCE), and is responsive to the final Office Action mailed April 20, 2007, in which a three (3) month Shortened Statutory Period for Response has been set, due to expire July 20, 2007. Enclosed is our fee for a one-month extension of time, to August 20, 2007. Claims 2-4, 8-9, 13-14 and 17 have been canceled without prejudice. Claims 1, 7, 12 and 16 have been amended. Claims 18-20 have been added. No new matter has been added to the application. The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090. Claims 1, 5-7, 10-12, 15-16 and 18-20 are pending.

A Request for Continued Examination (RCE) is filed concurrently with this Amendment so that the Office Action mailed April 20, 2007 is effectively made non-final. Under 37 U.S.C. 1.114, the effect of the RCE, which makes the instant Office Action non-final, is to cause examination of the instant application to remain open. Accordingly, amendments submitted herein are to be entered as a matter of right, and each claim is entitled to continued examination, particularly with respect to the responses provided herein.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 16-17 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which the applicant regards as his invention.

Claim 16 has been amended above to more particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In particular, claim 16 has been rewritten to recite “an optical recording medium having at least a first recording layer and at least a second recording layer” as interpreted by the Examiner in the Office Action.

Consequently, claim 16 is allowable under 35 U.S.C. § 112, second paragraph.

As mentioned above, claim 17 has been canceled.

Rejections Under 35 U.S.C. § 102(b) and 35 U.S.C. § 103

Claim 16 was rejected under 35 U.S.C. § 102(b) as being anticipated by Miyamoto et al. U.S. Patent No. 6,236,635 (hereinafter “Miyamoto”). Claims 1, 3, 4, 7, 9, 12, 14, 15 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Miyamoto in view of Ito et al. U.S. Patent No. 5,768,251 (hereinafter “Ito”). Applicants respectfully traverse the Examiner’s rejections.

One embodiment is directed to an optical recording medium including a first information recording layer on a second information recording layer. A pulse-like laser beam having modulated power is projected onto the optical recording medium via a light incidence plane disposed thereon and information may be recorded onto the first or the second information recording layer. The first information recording layer is located on the side of the light incidence plane with respect to the second light incidence plane. The second information recording layer is irradiated with the laser beam via the first information recording layer. A top pulse and/or a last pulse of the laser beam is set lower than a recording power of a multi-pulse thereof when information is to be recorded in the first information recording layer. The top pulse and/or the last pulse of the laser beam is set to be substantially the same as the multi-pulse thereof when the information is to be recorded in the second information recording layer.

In particular, claim 16 recites, *inter alia*, “A method for recording information in an optical recording medium having at least a first recording layer and at least a second recording layer...projecting a laser beam...via light incidence plane...setting the recording power of the top and/or last pulse to be substantially the same as the recording power of the other pulses within the laser beam when at least one mark is to be recorded in the second recording layer while the first recording layer is located on a side of the light incidence plane.”

Miyamoto does not teach or suggest the invention of claim 16. Miyamoto teaches an optical recording medium having a single recording layer. *See e.g.*, Figure 1, label 15; col. 5, lines 15-26. Thus, Miyamoto does not teach or suggest a method for recording information on a first and a second recording layer, as taught in claim 16.

Consequently, claim 16 is allowable over Miyamoto.

Miyamoto and Ito do not teach or suggest the invention of claim 1. In particular, claim 1 recites, *inter alia*, “An information recording method for recording information in an optical recording medium...wherein the first information recording layer is located on a side of the light incidence plane with respect to the second information recording layer and the second information recording layer is irradiated with the laser beam via the first information recording layer...recording information in the second information recording layer with the recording powers of the top pulse and/or the last pulse of the laser beam set to be substantially the same as the recording power of the multi-pulse thereof.” (Emphasis added.)

Firstly, Miyamoto and Ito fail to teach or suggest a second information recording layer irradiated with a laser beam through a first information recording layer, as recited in claim 1. In particular, Miyamoto discloses a disk-shaped information recording medium including a single recording layer, a second reflective film 19 and a first reflective film 18 provided on the side of a UV radiation curable plastic protective film 20. *See e.g.*, Figure 1. Since the reflective films 18, 19 prevent high light transmission, it is apparent that a laser beam can only be projected onto the record film 15 via a polycarbonate base 11, which is positioned opposite the radiation curable plastic protective film 20.

Ito discloses one side type disks 66A, 66B adhered by a joint member 64 to provide one disk 60 of two sides having a first and a second recording layer 65A, 65B opposite each other. *See e.g.*, col. 13, lines 1-5. Ito further teaches an optical head 63 that is moveable between both sides of the disk 60 or optical heads 63 fixedly positioned proximate respective sides of the disk 60. The optical head 63 may be moved proximate the one side type disk 66A to project a laser beam thereon when information is to be recorded in or reproduced from the recording layer 65A. Alternatively and/or additionally, the optical head 63 may be moved proximate the one side type disk 66B to project the laser beam thereon when information is to be recorded in or reproduced from the recording layer 65B. *See e.g.*, Figures 15 and 16; col. 13, lines 12-16.

Therefore, the disk 60 of Ito is such that when information is to be recorded in or reproduced from one of the recording layers 65A, 65B, the laser beam is projected onto a

respective one of the recording layers 65A, 65B without passing through the other one of the recording layers 65A, 65B.

Thus, the *hypothetical* combination of the teachings of Miyamoto and Ito, as suggested in the Office Action, would result in a two-sided disk such that when information is to be recorded in one of a first and a second recording layer a laser beam is projected onto the respective one of the first and the second recording layers. More specifically, the laser beam is projected only onto the respective one of the first and the second recording layers without passing through the other respective one of the first and the second recording layers. Thus, the combination of Miyamoto and Ito does not teach or suggest a second information recording layer that is irradiated with the laser beam via the first information recording layer, as recited in claim 1.

Secondly, Miyamoto and Ito do not teach or suggest recording information in a second information recording layer, opposite the light incidence plane, with recording powers of the top pulse and/or the last pulse of the laser beam set to be substantially the same as the recording power of the multi-pulse thereof. Page 7 of the Office Action contends that it would be inherent that if the two-sided disk, as disclosed by the combination of Miyamoto and Ito, were to be flipped so that the second side can be recorded upon then the apparatus of Miyamoto can record marks using multi-pulse trains as shown in Figure 11 of Miyamoto. Thus, it appears that the Examiner clearly admits that it is necessary to reverse (*e.g.*, flip) the two-sided disk when information is to be recorded in the second recording layer.

As such, in the two-sided disk discussed above, a recording layer in which information is to be recorded must be located on the light incidence plane relative the other recording layer. Consequently, it is unnecessary to transmit different pulse train patterns for modulating the power of a laser beam depending upon whether information is to be recorded in the first or the second recording layer. Thus, the combination of Miyamoto and Ito fails to teach or suggest “recording information in the second information recording layer with the recording powers of the top pulse and/or the last pulse of the laser beam set to be substantially the same as the recording power of the multi-pulse thereof.”

Thirdly, unlike the two-sided disk described above, the first recording layer of claim 1 has sufficiently high light transmittance such that the first recording layer has either substantially no reflective film or a thin reflective film *See e.g.*, pages 3 and 4 of the present application. As a result, heat radiation characteristics differ between the first information recording layer and the second information recording layer. Thus, if the pulse train pattern of the laser beam for recording information in the first information recording layer were the same for recording information in the second information recording layer, a recording mark having a desired shape would not be formed in one of the first or the second information recording layers.

Consequently, different pulse train patterns of the laser beam are used depending on whether information is to be recorded in the first recording layer or the second recording layer, as taught in claim 1. Unlike claim 1, the two-sided disk described above records information in the first and the second recording layers using the same pulse train pattern.

Thus, the combination of Miyamoto and Ito, does not teach or suggest recording information in the first information recording layer by setting the recording powers of a top pulse and/or a last pulse of the laser beam to be lower than the recording power of a multi-pulse thereof, and in the second information recording layer with the recording powers of the top pulse and/or the last pulse of the laser beam set to be substantially the same as the recording power of the multi-pulse thereof.

For the foregoing reasons, claim 1 is nonobvious in view of Miyamoto and Ito.

Although the language of claims 7, 12 and 16 are not identical to that of claim 1, the allowability of claims 7, 12 and 16 will be apparent in view of the above discussion. Thus, claim 9, which depends from claim 7 and claims 14-15, which depend from claim 12, are nonobvious in view of Miyamoto and Ito. Similarly, amended claim 16 is not anticipated by or rendered obvious over Miyamoto, alone or in combination with Ito.

Claim 17 has been canceled.

Claims 5, 6, 10 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Miyamoto in view of Ito and further in view of Suzuki U.S. Patent No. 6,771,579 (hereinafter “Suzuki”).

Miyamoto, Ito and Suzuki do not teach or suggest the invention of claims 5-6, which depend on claim 1. In particular, Suzuki fails to teach the features of claim 1 that are missing from Miyamoto and Ito. More specifically, Suzuki does not teach or suggest irradiating the second information recording layer with a laser beam via the first information recording layer or setting different pulse train patterns for recording information in the first and the second information recording layers, as taught in claim 1. The Office Action has cited Suzuki only for teaching “an optical recording method in which a wavelength (λ) of the laser beam and a numerical aperture (NA) of an objective lens satisfy the condition that λ/NA is equal to or shorter than 700nm” and “an optical recording method in which the laser beam has a wavelength (λ) of 200nm to 450 nm.” Such conditions are unrelated to the missing teachings of Miyamoto and Ito. As such, Miyamoto, Ito and Suzuki fail to teach the invention of claims 5-6. Thus, claims 5-6 are nonobvious in view of Miyamoto, Ito and Suzuki.

Miyamoto, Ito and Suzuki do not teach or suggest the invention of claims 10-11, which depend from claim 7. In particular, Suzuki does not teach or suggest the features of claim 7 that are missing from Miyamoto and Ito. More specifically, Suzuki does not teach or suggest irradiating the second information recording layer with a laser beam via the first information recording layer or setting different pulse train patterns for recording information in the first and the second information recording layers, as taught in claim 7. The Office Action has cited Suzuki only for teaching “an optical recording method in which a wavelength (λ) of the laser beam and a numerical aperture (NA) of an objective lens satisfy the condition that λ/NA is equal to or shorter than 700nm” and “an optical recording method in which the laser beam has a wavelength (λ) of 200nm to 450 nm.” Such conditions are unrelated to the missing teachings of Miyamoto and Ito. As such, Miyamoto, Ito and Suzuki fail to teach the invention of claims 10-11. Thus, claims 10-11 are nonobvious in view of Miyamoto, Ito and Suzuki.

New Claims 18-20

Miyamoto, Ito and Suzuki, taken alone or in combination, do not teach or suggest the limitations of claim 18.

Although the language of claim 18 is not identical to that of claims 1, 7 and 12, the allowability of claim 18 will be apparent in view of the above discussions. As discussed above, Miyamoto, Ito and Suzuki, taken alone or in combination, do not teach or suggest “an optical head operable to...transmit the laser beam through the first recording layer onto the second recording layer to record information on the second recording layer,” as recited in new claim 18.

Thus, new claim 18 is allowable as are claims 19-20, which depend therefrom.

Conclusion

Overall, the cited references do not singly, or in any motivated combination, teach or suggest the claimed features of the embodiments recited in independent claims 1, 7, 12, 16 and 18 and thus such claims are allowable. Because the remaining claims depend from the allowable independent claims, and also because they include additional limitations, such claims are likewise allowable. If the undersigned agent has overlooked a relevant teaching in any of the references, the Examiner is requested to point out specifically where such teaching may be found.

Application No. 10/505,194
Reply to Office Action dated April 20, 2007

In light of the above amendments and remarks, Applicants respectfully submit that all pending claims are allowable. Applicants, therefore, respectfully request that the Examiner reconsider this application and timely allow all pending claims. Examiner Giesy is encouraged to contact Mr. Stern by telephone to discuss the above and any other distinctions between the claims and the applied references, if desired. If the Examiner notes any informalities in the claims, he is encouraged to contact Mr. Stern by telephone to expediently correct such informalities.

Respectfully submitted,
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